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Healthcare Access for Migrants in China: A New Frontier*

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Abstract

How can healthcare access for Chinese migrants be improved? Migrant workers face two types of healthcare-access exclusion in the workplace: a financial one (via income) and a legislative one (from the *hukou*). We use 2006 data from a survey of rural migrant workers conducted in five of the most economically-advanced cities. We estimate a fixed-effect probit model, and control for the non-exogeneity of health insurance. The empirical findings support the hypothesis of a return to the hometown for migrant workers with poor health. Apart from residency permits and income, the social integration of migrant workers is also found to be a decisive factor in healthcare access. Policies tackling migrant healthcare exclusion should thus involve organisations working at the local level, such as residents' committees.

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1 Topic

In China, the rights of individuals are mainly established for the location specified by their permanent residency permit ("hukou"). However, by definition migrants do not live in the town of their permanent residency permit where their rights in terms of healthcare access are located. The question of healthcare access may therefore be an issue for migrants. The growth in Gross Domestic Product (GDP) has been paralleled by an expansion in healthcare expenditures. From under 3 percent of GDP in 1980, these grew to 5.3 percent in 2000,[1] with expenditure on health increasing even more rapidly in urban than in rural areas. As the percentage of migrants in cities increases, their access to education and healthcare has become an increasingly central issue in China. This paper deals with healthcare access for these migrant workers.

On top of their existing 103 Million urban migrants, Chinese cities continue to experience a steady migration inflow. In terms of health, one consequence is a falling proportion of rural population living in extreme poverty and improvements in the level of nutrition. Life expectancy at birth in 2002 was 71 years, which is four years higher than the world average figure (Liu and Yi, 2004). As the disastrous famine in the late 1950s resulted in high mortality, this current life expectancy figure represents an enormous improvement within China. Other health indicators such as the infant mortality rate, the under-five mortality rate, and the maternal mortality rate have also registered improvements.

However, this expansion of healthcare is also mostly unequally distributed. Economic reforms have had positive effects on GDP and the level of nutrition, but have led to the collapse of the public healthcare network and universal access to basic healthcare. The result is an increase in healthcare inequality. Periodically, the World Health Organization (WHO) ranks countries according to the inequality of their healthcare systems, and in particular their healthcare insurance system. According to the WHO [World Health Report 2000], the Chinese health sector was ranked close to the bottom in terms of the fairness of financial contributions, with a rank of 188 out of 191 countries.

There is by now a large body of literature addressing the question of health inequality around the world (Deaton, 2003). Various methods of analysis have been developed, some making use of advances in the literature on income distribution and taxation. Work has focused on individual countries as well as comparing many different countries (Wagstaff *et al.*, 1999). In the case of China, however, there is very little literature. Bloom and Gu (1997) analyze the causes of the increase in medical care costs, and the deterioration in preventive programmes in some poor areas. Liu and Mills (2002) also focus on the

[1] See Figure 1. Source: 1980-1989 data from Hossain (1997); 1990-1994 data from the Institute of Health Economy, Ministry of Health, 1999; 1995-2000 data from China Statistic Yearbook, 2002.

reduction in the demand for the use of preventive services. A growing number of papers have considered the effect of the introduction of the New rural Cooperative Medical Scheme (NCMS). Jackson *et al.* (2005) compare the introduction of NCMS with the out-of-pocket system in Henan province. Wagstaff *et al.* (2009) also analyze the introduction of the NCMS, but for different provinces in China, and provide an extensive review of this new literature. However, empirical studies on healthcare and migrants have attracted almost no attention in existing research.

The goal of this paper is therefore to single out the main determinants of healthcare access. We highlight migrants' healthcare exclusion due to both income and the *hukou*. We shed light on the importance of both material and social capital, or life conditions, for migrant workers in providing greater access to healthcare. Above all, we provide new evidence on the decisive role of social networks on migrants' healthcare access. Two pieces of work in Sociology, Bai and He (2003) and Zhang *et al.*(2007), used qualitative methods to underline the effect of health on the decision to return home. Our empirical findings support the hypothesis of the return home for migrants with health problems. We are the first to highlight this pattern of exclusion using an empirical strategy and to emphasise the importance of social networks, the residence registration system and the support of family and relatives in the outcome of the treatment in compelling migrants to leave the city.

In Section 2, we present the Chinese context. The description of the data and some preliminary statistics on migrants and healthcare are given Section 3. The econometric model is presented in Section 4. In Sections 5 and 6, we present the first econometric results and explore migrants' healthcare acess depending on their health status. Last, Section 7 concludes.

2 The Chinese context

The economic reforms in China have produced remarkable growth in GDP. This growth has been particularly concentrated in certain areas, mainly the major cities in the Eastern and South-Eastern part of the country, leading to massive internal migration.

Since the late 1970s, the economic take-off in some urban centers has created a huge demand for labor in these areas and triggered a wave of migration. The general GDP growth across the country led to rising labor demand at the local level in most areas, but much less so than that in these industrial centers (Liang, Chen and Gu, 2002). By 2020, the forecast is that more than 50% of China's total population will live in towns and cities. This implies that in coming years about three hundred Million farmers will leave rural areas. This will be the largest migration of population mankind has ever experienced.

This internal migration raises a number of issues. One core issue in China is the conflict between the greater welfare associated with economic reforms and the deterioration of healthcare insurance. While economic reforms have had positive effects on GDP and the level of nutrition, they have also led to the collapse of both the public-healthcare network and universal access to basic healthcare. The result has been an increase in healthcare inequality.

To help understand this degradation, we now present a brief description of the healthcare-insurance system before the economic reforms and its subsequent evolution. In China, before the economic reforms, the healthcare-insurance system was not homogeneous. In urban areas, it depended on large state-owned conglomerates that took care of their workers' medical needs; healthcare in rural areas was determined locally. However, out-of-pocket expenses were almost zero whatever the healthcare setup. In urban areas, the dismantlement of the large state-owned conglomerates led to healthcare supply by smaller-size units. These units quickly ran into difficulties in financing their own social insurance, as had previously been the case. There are two main reasons for this: first, they are smaller than before, and so the pooling insurance is based on a smaller number of individuals; second, they are responsible for the profit (no intervention of the state) but part of the profit is used for social insurance. Facing the risk of collapse in the economic framework, the government was forced to react. They introduced a kind of social insurance, but with a far lower level of coverage than before. In rural areas, farmers were themselves made responsible for social insurance through a pooling system at the village level. Therefore, the rapid privatization of farming was de-connected from the financial burden of social insurance for rural inhabitants. Farms were not obliged to use part of their profits for social insurance, therefore there was no risk of collapse of the agricultural sector. As such, the government did not have to step in to provide an insurance system for the rural population as it did for the urban population. The result was the partial, and sometimes complete, disappearance of the healthcare-insurance system in rural areas.

Living in an urban area does not mean being a urban citizen. Healthcare insurance rights, and others, depend on a permanent residence registration system, the "Hukou". The hukou is determined by place of birth and family background. There are sharp restrictions on changing from a rural to a non-rural Hukou, with only few exceptions such as graduating from university and becoming a cadre of the Communist party. The Hukou, initiated in 1955 requires all residents to live in the place where they were born and obtain permission to move (Cheng and Selden, 1994). Up to the 1970s, enforcement of the Hukou policy was very strict and migrants were even transferred back to their villages in order to prevent over-urbanization. Since the late 1970s, the willingness of the authorities to encourage economic take-off has led them to be more flexible about the Hukou policy. People from rural areas can now move to urban areas in order to work with temporary mobility permits. However, labour demand has not suppressed the "Hukou". As these migrants still hold a rural Hukou, they do not have access to urban

healthcare insurance, but only have access to public services from the place of their residency permit. The aim is to avoid over-urbanization; however, this limitation does have an impact on healthcare access.

Leaving rural areas therefore does not produce urban dwellers. A survey conducted by Fudan University on 30,000 migrant workers in major Chinese cities revealed that only 7.6% of them are satisfied with their life in the city, and that 68% are convinced that the city will not accept their integration. [January 14, 2008 China Daily].

There is another element which may also play a role in determining migrants' healthcare access. In Chinese hospitals, family and relatives play a crucial role in the treatment and recovery process. Healthcare providers furnish only minimal accommodation and catering. When someone is at hospital, relatives have to be present to support the patient through meals and helping with their treatment. The presence of relatives also affects the way in which hospital staff treat the patient. The presence of family and relatives in the city can therefore also be a key component of healthcare access in the city.

In theory, migrants are supposed to claim for medical care benefits in the locations where they are registered. Even if most migrants do not have access to urban health insurance, in some cities like Shanghai specific health-insurance schemes for migrants have been developed. These local policies are increasingly frequent in China, but still cover only a small percentage of migrants and the level of coverage is very low. Hence, the Hukou and the need for family support in hospital push migrants to return to their place of registration. The Sociology literature, based on hometown surveys, shows this pattern. Health conditions that reduce the capacity to work (including old age, pregnancy, and recent childbirth) push migrants to return home to seek family support and to avoid the high medical and living costs in cities (Bai and He, 2003 ; Zhang *et al.*, 2007; Hua *et al.*, 2008).

To soften the distinction between the insured and the uninsured, we should underline that the level of coverage is often fairly low even for the insured.

The healthcare system is organized so that hospitals that can treat serious health conditions are only found in larger cities. For very severe health conditions, migrants can obtain some help from the local government in their place of work or from the firm. Migrants may thus prefer to stay in the city in order to obtain adequate healthcare. In this paper, we will therefore distinguish acute health problems from other types of disease or injury.

3 Migrants in five big cities

3.1 The survey on five cities

We use data from the Survey of Rural Migrant Workers Health and Social-economic Status in 2006. This survey was conducted by the National Population and Family Planning Commission of China and the Institute of Economics of the Chinese Academy of Social Sciences (CASS). The sample is composed of 2 398 interviewees with health and social-economic status information. Interviewees are rural-urban migrant workers. Rural-urban migrant workers are defined as workers who migrate from rural areas to cities. They come from rural areas and have rural hukou: they do not have the permanent city hukou from the place where they work. As noted above, the type of hukou has serious implications in term of public-service access, including health insurance. Rural-urban migrant workers are selected by their work unit. This sample was constructed to be representative of rural-urban migrant workers with a formal job and in a regular situation. Therefore, this sample is composed of migrants in socio-economic situations that are called non-critical. The sample excludes migrants with informal jobs and self-employed migrant workers.

The survey covers fives cities: Chongqing, Dalian, Shanghai, Shenzhen and Wuhan. These five cities represent five of China's geographical regions, which all have their own economic characteristics. All five of these cities have economic indices amongst the highest in the country and contain substantial numbers of rural migrant workers. Dalian represents Northeast China; Shanghai represents East China and is the economic hub of the country; Wuhan represents Central China; Shenzhen represents South China - this city is archetypal of the Pearl River Delta region, the biggest manufacturing base for exports; Chongqing represents Southwest China and is one of the biggest cities in the country; Northwest China is less-developed and contains fewer rural migrant workers.

Tables 1 and 2 show the sample characteristics. The average age is about 27 and there are no old people in the sample, which is typical of Chinese migrant characteristics. Migrants are younger in Dalian and Shenzhen than in the other three cities. On average, they are older in Shanghai and Chongqing. One explanation may come from the type of activities that migrants do. In Dalian, Wuhan, Shenzhen and Chongqing, the sample mainly covers workers in industrial production lines, where the jobs are better-suited for younger workers. In Shanghai, the sample mainly comes from small companies and service industries where the physical job requirements may disqualify older migrants. The share of male and female workers is similar across cities.

In China, compulsory education lasts for nine years. In most provinces, these nine years of education include six years of primary school (or elementary school) and three years of junior middle school. Most

children start school at the age of seven. After junior middle school, they can choose to leave the education system. Beyond junior middle school, there are three types of education: first, senior middle school (and then high school after passing a national exam); second, vocational middle school; third, technical middle school. Most migrants come into the labor market after graduating from junior middle school, and some of them join the labor market after graduating from vocational middle school or technical middle school; only very few of them come into the labor market after graduating from high school. Dalian has the greatest variance in terms of the level of education: the smallest percentage of elementary school migrants and the highest percentage of vocational middle school migrants.

3.2 Health status

Health in this survey is measured by questions on whether health reduces the capacity to work. This seems apt as Chinese migrants often ignore health problems unless they affect their capacity to work. These questions were designed by Fan Ming (2002) to rank incapacity or injuries that limit migrants' labor supply. Following Fan Ming (2002), a health indicator, *Health1*, is constructed from these objective health questions which ranks labor-supply limitations for workers. This index is constructed from six questions, of which five are Yes/No and the other is on a scale from one to five. Each question is weighted. and our index is given by the weighted sum. The questions and the weights are shown in Figure 2. The indicator, *Health1*, takes values from 0 (very good health) to 30 (very poor health conditions limiting work).

We also add six variables for each of the six health questions. In the following, we call this index *Health2*.

Table 3 displays migrants' health conditions. Globally, the survey of population should be in good health, as young urban migrants are there to supply labor. In this survey, Wuhan is the city where migrants have the worst health, and Shanghai the city where migrants are in the best health, independent of the index that is analyzed.

3.3 Healthcare access

In this paper, we have two sources of information on healthcare expenditure: healthcare expenditures in the last month and average healthcare expenditures per year. These come from information declared by the migrant herself. Healthcare expenditures over the last month are commonly used as an index of healthcare access. However, here, the percentage of individuals with a positive value is very low, and the results using this variable are open to discussion.[2] The second source of information has a number of

[2]These results are available on request

advantages: the share of individuals declaring such healthcare expenditures is significant, and expenditure over a year is a more general measure of healthcare access.

We would like to measure healthcare access itself, *i.e.* the possibility that a migrant obtain access to any form of healthcare. As we are not able to obtain a direct measure of this healthcare access, we set up a proxy using average healthcare expenditures. When any healthcare expenditure is observed, we consider that the migrant has access to healthcare. The variable $HCA*$ is an unobserved continuous variable to which the discrete variable HCA is related via the relationship $HCA = 1/(HCA^* > 0)$.

These health indices measure health conditions that limit the capacity to work. Therefore, *a priori*, all of those who answered "Yes" to at least one of the questions should go to visit a Doctor.[3] Table 4 displays the results. Empirically, we see that only few of them actually do carry out this visit. In the data, 61% of individuals declare a positive average healthcare expenditure figure during the year in question. Dalian is the city where migrants have the least healthcare access.

3.4 Health insurance

Migrants have to claim for insurance reimbursment in the location where they are subscribed. Here, *health insurance* refers to subscribing to health insurance in the city, *i.e.* the workplace. This insurance is mainly subscribed by the firm. The term *health insurance* excludes NCMS insurance, to which migrants subscribe in their hometown.

Table 4 displays descriptive statistics. The level of insurance varies according to the city. While 80% of migrants are insured in Dalian, in Chongqing only 18% of migrants are so. In addition, healthcare access can also depend on having health insurance. In Shanghai and Wuhan, insured individuals have more healthcare access than do others, while in Dalian, Wuhan and Shenzhen insured individuals have less healthcare access than others do. Therefore, the effect of insurance does not seem to be unambiguous.

As noted above, there is no national-level health insurance system for migrant workers in China. Provincial governments and some city governments have their own policies regarding migrants' health insurance. The five cities in our survey have their own health-insurance systems according to local institutions. Specifically, Dalian and Shanghai provide health insurance for migrant workers, with a scheme different from the regular insurance systems for workers with city hukou. In Shanghai, the government has a comprehensive social insurance system for migrant workers, including three types of insurance: health insurance, pensions and work-related injury insurance. At the time of this survey,

[3]In urban China, people visit Doctors in hospitals. Therefore, in this paper "to go to the hospital" and "to visit a Doctor" mean the same thing

Shenzhen was in the process of setting up a health insurance system for migrant workers. Wuhan and Chongqing are different from the other three cities, as there is no health-insurance system for migrant workers. However, migrant workers in these two cities, as well as in the three others, have the option of joining the health-insurance system for city workers. There are two main benefits for migrant workers in subscribing to a migrant health-insurance system rather than to a regular health-insurance system. First, the fee in the city worker insurance system is higher than that for migrant health insurance; migrant workers, who earn less than city workers (on average) cannot necessarily afford the higher fee. Second, if a migrant worker participates in the city worker insurance scheme, she cannot then transfer her insurance benefits to other cities (or areas). However, we know that one of the key characteristics of Chinese migrant workers is that they frequently float [4] from one place to another. If they participate in one city's insurance scheme, they cannot subsequently transfer their insurance benefits to another location.

From the preliminary statistics, we can see that the city has an effect on healthcare access. We therefore use a fixed-effect probit model to explain healthcare access (HCA).[5] The Hausman test performed for each model (each column) supports the fixed-effect assumption.[6]

4 Estimation

Consider migrant i working in city p. Let HCA be the dependent variable measuring healthcare access. HCA is a binary variable indicating whether the migrant has access to health care *i.e.* had positive healthcare expenditure.

We use a fixed-effect probit model,

$$P(HCA_{ip} = 1|X_{ip}) = G(x_{ip}\beta), p = 1, ...5. \tag{1}$$

Here $G(.)$ is a known function taking values in the open unit interval, the subscript i denotes the migrant and p the city, and x_{ip} is a vector of explanatory variables including city dummies. The city dummies are included to control for city fixed effects.

If unmeasured variables which affect the outcome are also correlated with the migrant's participation in health insurance (e.g. unobserved migrant characteristics), the results of the fixed-effect probit

[4]The term "floating" may seem rather abusive. Migrants often retain links with their hometown, via having children in the village, Land Rights there, and so on

[5]Table 8 displays descriptive statistics for the independent variables.

[6]The term "fixed effect probit model" is mainly used when individual fixed effects are considered. Our model can also be viewed as a probit model with city dummies.

estimation are likely to be biased. To ensure consistent estimates, we re-estimate (1) employing IV estimation using firm-size indices. The migrant's participation in a health-insurance program will depend on the firm's subscription to health insurance, and so on firm characteristics. Controlling for industry (manufacturing, construction or services), the size of the firm is plausibly uncorrelated with unobserved individual characteristics. We also have information on firm ownership (State-owned firms, Joint-venture firms, private Chinese firms, and foreign firms). However, in China, firm ownership is correlated with healthcare access. State-owned firms often have some agreements with certain hospitals (for instance, with military hospitals that are on average of better quality), independent of any participation in an insurance program. Therefore, these variables are not good candidates for IV variables.

The IV model is estimated via MLE. In a preliminary step, we also use the Rivers-Vuong approach to test for the exogeneity of the migrant's participation in health insurance. For each model, the test rejects exogeneity (the results are available on request).

5 First empirical results

In the following, we do not take into account the *hukou* in the model, as all of the migrants in this survey are in the same situation: they do not have the permanent *"hukou"* to work in the urban area.

We show the results using the health index defined by Fan. The health-status index is recoded into four groups. However, the results are qualitatively similar when we consider dummy variables for questions about health (the list of questions appears in Figure 2).

Table 5 displays the results from the econometric model. Migrants' remittances reduce the migrant's net income. We might then expect a negative effect on healthcare access due to lower income. However, we actually find that migrant remittances increase healthcare access. Healthcare insurance has no positive and significant effect on healthcare access. Controlling only for demographic variables and the level of health, we find no effect of insurance on healthcare access, and when we control for income and migrants' remittances (Table 5, Column 5), we even obtain a negative significant effect. At first sight, this is worrying. The aim of healthcare insurance is to improve healthcare access.

In Section 2, we explained the possibility of selection bias in the data due to, inter alia, legislative aspects (the "*hukou*" and its consequences).

To test for selection bias is to test for migrant healthcare exclusion, but how can we test for selection bias? Having insurance does not mean being well-covered. The level of coverage may differ according to

the type of healthcare and the level of gravity. In China, the level of coverage is often low. Hence, as long as migrants consider their health condition as not being an issue for doing their job, they may ignore it. As the degree of gravity worsens, they react, which does not necessarily mean visiting a doctor in the location where they work; they can instead return to their hometown. They do so partly because in their hometown they benefit from family support, partly because they also may benefit there from health insurance. Recall that public-insurance benefits can only be claimed in the locations where migrants are registered. Migrants are excluded from the health system program set up for urban citizens with the "right" *hukou* in their working place.[7] Because our survey is conducted in the workplace, these migrants will therefore not have been interviewed.

While migrants may prefer to return to their hometown for more severe degrees of gravity, there is another factor which may keep migrants with poor health in cities. As described above, the Chinese health system is organized in such a way that hospital quality varies with the degree of urbanization, with cities offering better quality healthcare. After a certain degree of health severity[8], staying in the city may be a better option for migrants, as they there have access to an adequate quality level. Moreover, the level of co-payment is not so low for more severe health conditions, as municipalities in the working place and/or firms may also provide some financial subsidies in this situation, independent of the *hukou* (the registration permit).

We henceforth propose two models according to the degree of gravity. As the health indices do not capture lower degrees of severity, one model (*Model A*) considers migrants with health conditions that do not require a high degree of quality *i.e.* with health conditions that do not imply visiting a city hospital; the second model (*Model B*) considers migrants with more acute health conditions.[9][10]

[7] As noted, some work on rural areas has suggested that migrants return to their hometowns when they need healthcare (Bai and He, 2003 ; Zhang *et al.*, 2007).

[8] When the degree of gravity is severe.

[9] We examined different thresholds to define Models A and B. We used the third quartile and the ninth decile of the *Health1* variable; these produce very similar results. The results presented here pertain to the third quartile.

[10] We have no variable to hand to identify migrants who may eventually leave the city in the case of health problems. However, we know that there is potentially some subset of the population that is not present in our data due to incidental attrition. Because we only observe X (See Equation (1)) for migrants who stay in the city, and have no information on migrants who leave the city, the potential selection issue cannot be corrected. However, the comparison of the results for migrants with different levels of health problems allows us to examine the presence of selection bias.

6 Healthcare access: A behavior which depends on health status

We present the results according to Fan's index.[11] However, for a given level of this health index, we may still have within variations in health. In both *Models A* and *B*, we thus control for the within variation in health via the *Health2* index. However, the results are not sensitive to the inclusion of the *Health2* index in the regressions.

In this survey, health-insurance subscription is decided by the firm. The results could therefore be affected by the non-exogeneity of the effect of health insurance on healthcare access. In other words, the residual may contain an omitted variable that is correlated with health insurance. To resolve this issue, we have to find at least one instrumental variable that is partially correlated with the health insurance index once the other exogeneous variables in equation (1) have been controlled for. Here, we propose the size of the firm (small, medium or large). The results of instrumental-variable estimation are displayed in Column 6 of each Table.

We therefore deal with the potential non-exogeneity of health insurance, but what about the potential non-exogeneous effect of NCMS insurance on healthcare access in the city? In China, the system of insurance is associated with one location. Migrants cannot take insurance benefits to another location. Because the NCMS is associated with the hometown, NCMS subscription may have an effect on the decision to return to the hometown, but is not a substitute for the city insurance system. Because we focus on the workplace (the place where the survey was conducted), the subscription to NCMS insurance should not be an issue here.[12] As noted above, the term *health insurance* is for subscription to health insurance in the city, *i.e.* the workplace.

6.1 Migrants' exclusion from healthcare access

The results are displayed in Columns (1), (2) and (3) of Tables 6 and 7.

Columns 1 to 3 of Table 7 display the results of *Model B*. Regarding the demographic variables, age is positively associated with healthcare access, and women migrants have better healthcare access than do men. To control for the severity of work, we include variables for industry and type of firm. Only working for a State-owned firm has an effect on healthcare access. Before the economic reforms, all those working in State-owned firms had complete healthcare coverage. The situation now is less clear, as this access has gradually deteriorated and migrants usually do not have access to this insurance. However,

[11] We have also considered the unweighted index, which does not change the results

[12] The results without the NCMS index are unchanged. These are avalaible on request.

with the challenge of migrants' healthcare access, these firms are encouraged to facilite healthcare access to migrants with more severe health conditions.

The level of income acts as a push factor on healthcare access. The lower is income, the less likely is the migrant to have healthcare access. The financial domain is then one determinant of migrants' exclusion from healthcare access.

We here focus on more severe health conditions. The optimal behavior is therefore to stay in the city in order to benefit from an adequate level of hospital quality. First of all, we find that education, migrants' remittances and health insurance all play their expected role: education increases healthcare access; remitting to the rural family has a negative effect on healthcare access; and insurance positively and significantly influences healthcare access. Hence, on the sample where we suspect selection to be less of a problem, we do obtain the expected correlations.

Table 6 displays the results from *Model A*. First, education has a negative and significant effect on healthcare access. With *Model B*, we found that education has a positive and significant effect on healthcare access. In the light of potential selection, when people have health problems, but not very severe ones, the higher is the level of education, the more they leave for their hometown. Those who do not leave the place of work are those who are not excluded from the healthcare system for some reason that we have not yet identified[13] or those who cannot leave. This could be for financial reasons or due to a lack of family/relatives support in the hometown. As noted above, the term "floating" for migrants is sometimes exaggerated. Some of them no longer have any contact with the hometown.

Second, remiting has a positive and significant effect on health care whereas the remittance has a negative effect on healthcare access in *Model B*. Migrants who remit are those who have contact with their hometown. Therefore, these are the ones who leave the place of work when their health is bad enough. This selection effect therefore leads to a sample with only a small percentage who have healthcare access and remit. As income plays a strong positive role in healthcare access, those who do not have healthcare access are the poorest whatever the level of remittance.

Health insurance has a significant negative effect on healthcare access. This effect can also be viewed as reflecting selection. With *Model B*, we found a positive effect of health insurance. This result suggests that the level of coverage for migrants in the working place is not enough to allow them to have healthcare access in the working place. Therefore, migrants who can afford to return to the hometown and who still have contacts in the hometown, prefer to return to the hometown.

[13]We present the determinants in the next Section

In addition, in Table 4 we can see that the percentage of insured migrants in Dalian is about three times that in the other cities, and mean health expenditures in Dalian are about 80% higher than those in the other cities. Even so, migrants have less healthcare access than in the other cities. To control for any specific Dalian effect, we thus add an interaction variable between the index for being a migrant in Dalian and being insured. Adding a specific Dalian effect does not change the results. Equally, all of the models have been re-estimated without the observations from Dalian, which did not change the results.

The selection bias thus appears clearly. Health insurance and education have a negative impact on healthcare access, whereas remitting induces greater healthcare access. These results are the opposite to intuition and are the opposite of those in *Model B*. However, in terms of selection bias these results make sense. Due to this bias, the subsample of migrants with healthcare access is composed of those who do not have enough contact with the hometown to return there. Therefore, our empirical findings highlight two forms of exclusion: *i)* exclusion for financial reasons - not only can migrants not afford healthcare access, but neither can they afford to return to their hometown; *ii)* the results confirm the hypothesis of exclusion from the healthcare access in the workplace for migrants with bad health.

6.2 Integration in the city

We now add indices of integration in the city to the model (in Columns 4 to 6 of Tables 6 and 7). The survey includes a number of different questions on life conditions. We introduce expenditures as life-condition indicators. Specifically, we use clothing, transportation, housing and education expenditures as proxies for life conditions. With respect to education, the presence of such expenses means that a child lives with the migrant. In China, the majority of migrants' children live in the rural area with their grand-parents. Apart from financial reasons, another consideration is that migrants' children have no access to public schools because of the "*hukou*". Individuals only have access to public services from the town of their residency permit. Therefore, migrants' children only have access to public schools in the place where they are registered. Consequently, migrant's children who live with their parents have to go to private schools. In addition to the subscription fee, parents have to pay additional fees for not having the right "*hukou*". Therefore, education expenses are a good proxy for better life conditions. Equally, spending money on transport says a lot about life conditions. In China, migrants in extreme situations do not have houses. They live in tents or prefab housing close to their job. Therefore, transportation expenses suggest that migrants live in better conditions. In conclusion, education and transportation expenses are proxies for integration in the city .

In *Model B* (Table 7), all of the expenses have a positive effect on healthcare access except for transportation expenditures. As noted above, migrants with transportation expenditures are more likely

to have real accomodation rather than a tent or prefab housing close to their place of work. However, transportation expenditure necessarily reduces migrants' disposable income (going to work leads to transportation expenditures). Controlling for income, the type of job and other types of expenditures, this may explain the negative effect.

We have also introduced control variables for the type of work contract and ownership of durable goods: motorbike, bicycle, VCD/DVD, TV, washing machine, mobile phone, microwave or oven, refrigerator, gas stove and computer. Controlling for social capital and expenditures, these new variables have no impact on healthcare access. Moreover, we have information on family structure, but this has no effect on migrants' healthcare access either.[14]

With respect to the social network, we appeal to information on the presence of networks, the number of acquaintances or friends, and the way in which the migrant obtained her job. Having friends or acquaintances and being in a better socio-economic situation are two different phenomena. Friends or acquaintances can provide help in the case of worsening health. Social networks thus present one reason to remain in the city despite the *hukou*, a legislative incentive to leave, and regardless of the individual's health.

Social integration has a very strong significant effect on healthcare access, with a marginal effect of about 60%. We also find that having friends or acquaintances acts as a significant positive factor in healthcare access, with a marginal effect of 67.3%.

On the selected sample, the social network also explains healthcare access. In *Model A*, we find that having friends or acquaintances acts as a significant positive factor in healthcare access. This positive and significant effect of social networks echoes that in *Model B*. The marginal effect here is 45%. One of the main results of this paper is then the importance of the network and social capital on the healthcare access of migrant workers. Networks act as a push factor in determining healthcare access. Despite the *"hukou"*, they allow migrants to obtain access to healthcare.

Table 6, Columns (4) and (5) display results on the non-exogeneity of the effect of health insurance on healthcare access. Instrumented health insurance actually has no significant effect on healthcare access (Columns (6)). Therefore, the negative effect of the life-condition indices on healthcare access is consistent with both the selected sample (*Model A*) and the results in *Model B*.

[14]We do not present the results controlling for "the way in which the migrant obtained their job", family structure and the ownership of durable goods as none of the estimated coefficients were significant, and their inclusion does not change the other results.

7 Conclusion

This paper uses data from the Survey of Rural Migrant Workers Health and Social-economic Status in 2006, covering five cities in China: Chongqing, Dalian, Shanghai, Shenzhen and Wuhan. These five cities are among the most industrialized with the most rural migrant workers. They represent China's five geographical regions with their respective economic characters. Using this dataset, the results highlight two exclusion factors: a financial factor (income) and a legislative factor (the *hukou*). We present new evidence on the determinants of healthcare access for migrant workers. While, as expected, financial support is one of the key factors, another is the social network and the feeling of being socially integrated. This shed lights on the ability of social networks to tackle exclusion from healthcare access.

There is no national-level health insurance system in China. The right to healthcare insurance and other benefits depends on a permanent residence registration system, the *"hukou"*. Individuals are only supposed to claim for medical care benefits in the location where they are registered. Therefore, not only are migrants excluded from urban public health insurance, but they also have to return to their place of registration in order to take advantage of rural public health insurance. Due to these legislative factors, migrants are excluded from healthcare access in their workplace. In addition, in Chinese hospitals, family and relatives play a crucial role during treatment, as hospitals provide only a poor level of accommodation and catering. When someone is in hospital, relatives need to be present to support the patient with meals and helping with their treatment, and the presence of relatives is indeed an important element in the way in which individuals recover. Hence, both the *hukou* and the need for family support in hospitals push migrants to return to their place of registration. However, this "push factor" is softened by the organization of the Chinese health system, where hospital quality differs according to the level of urbanization, with cities offering the best healthcare quality. Those with severe health conditions will have access to adequate healthcare quality in a city hospital. Staying in the city may be the best option for these migrant workers. In this paper, we thus distinguish two models of healthcare access according to the gravity of the health condition.

As long as migrants do not consider their health problems to be an issue in terms of doing their job, they may ignore them. When the gravity of their condition becomes an issue for their work, they react. Reacting does not necessarily mean a visit to a Doctor in their place of work. As noted above, the *hukou* excludes them from healthcare access, and they may then return to their hometown. As our survey is conducted in the workplace, these returning migrant workers do not appear in this survey. This selection bias appears clearly in our empirical results. Migrants who can afford to return to their hometown and who still have contact in their hometown, do indeed return there.

Apart from residency permits and income, we last show that social networks (having friends or acquaintances) stands out as a significant determinant of healthcare access. This highlights the importance of migrants' networks for healthcare access. Feeling socially integrated also has a strong positive effect on healthcare access for migrant workers with poor health. As such, social integration seems to be a key factor influencing healthcare access. But what about those who cannot afford to return to the hometown and those who no longer have contact with relatives in their hometown? Should they stay out of the healthcare system in their workplace without any other perspectives? Targeting this population will allow to define the specificity of this population (the younger tier, the older tier, the female ones?) and to establish an adequate healthcare-access policy.

In this paper, we use data from migrants selected by their work unit. These migrants have formal jobs and are in a regular and non-critical situation. Here, we do not study the bottom of the migrant population. Our results thus give then a much less critical picture than the reality. However, we have already identified some difficult situations even in this more rosy picture. Implementing an adequate and efficient health policy would then seem to be a priority.

One efficient policy to improve migrants' healthcare access in China would be to focus on improving their social integration in the city in which they work. One way is to build up migrants' social capital by improving their networks. The resident committee may be the perfect vector for such a policy. Resident committees are defined at the neighborhood level in urban areas in China, and are the place where nominated residents manage neighborhood affairs and state-citizen interactions. To data, migrants have not always been well-integrated in these committees, even if they have a "real" house. Therefore, encouraging committees to include migrants could be a good way of improving their healthcare access.

We have shown the importance of integration for migrants' healthcare access. However, we have not explained the mechanism behind this result. It would be of interest to determine the channel through which integration affects healthcare access: via better information, for example? Via interactions with local workers influencing the behavior of migrant workers? It is also important to know whether this integration process only affect healthcare access, or other domains of life as well, such as children's education.

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8 Appendix

Figure 1: The change in public health expenditure in China 1980-2000 as a percentage of GDP

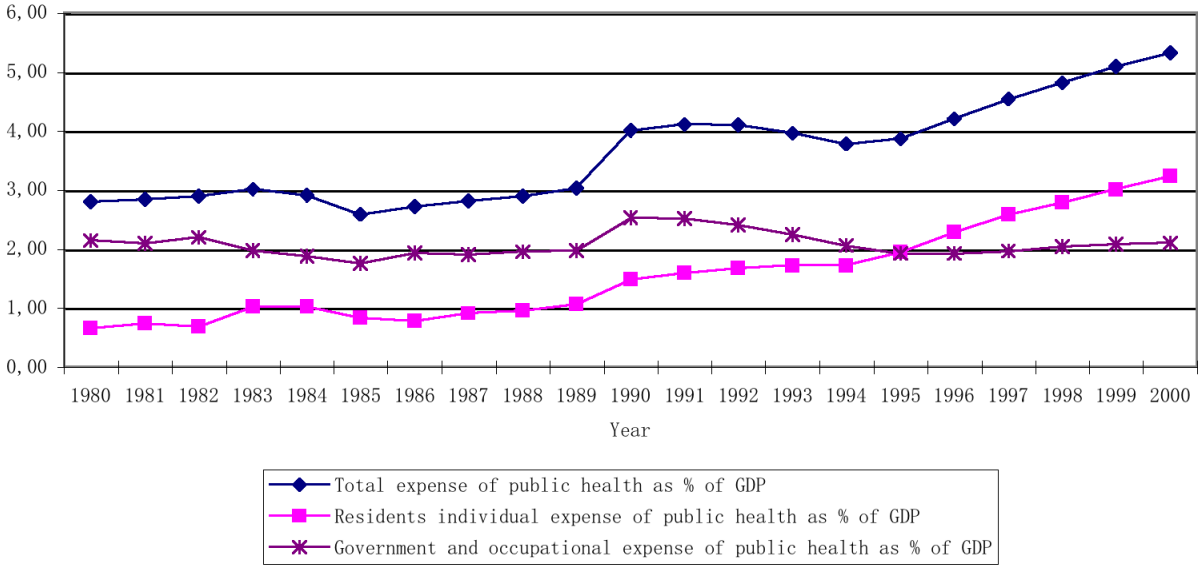

Table 1: Gender and age by city

Code	City	Male	Age		Total
		%	Mean	Std. dev.	No. Obs.
21	Dalian	26.03	24.90	5.29	366
31	Shanghai	53.78	31.20	9.29	543
42	Wuhan	57.73	28.56	9.05	466
44	Shenzhen	45.38	26.36	7.23	498
50	Chongqing	51.24	30.85	8.35	525
	Five Cities	48.00	28.65	8.46	2 398

Source: CASS Migrants' survey, 5 cities, 2 398 observations.

Table 2: Education structure

%	Dalian	Shanghai	Wuhan	Shenzhen	Chongqing	Five Cities
Illiteracy	0	2.03	0.43	0.40	1.71	1.00
Elementary School	1.37	14.55	8.80	9.04	13.14	9.97
Junior Middle School	54.37	53.59	57.94	63.45	52.57	56.38
Senior Middle School	12.84	18.05	19.96	16.27	18.48	17.35
Vocational Middle School	19.95	1.47	2.36	2.81	2.67	5.00
Technical Middle School	7.38	4.60	8.80	6.63	7.62	6.92
Junior College	3.83	4.24	1.07	1.00	3.81	2.79
College	0.27	1.47	0.64	0.20	0	0.54
Total	366	543	466	498	525	2 398

Source: CASS Migrants' survey, 5 cities, 2 398 observations.

Table 3: Health distribution by city

Province *Health1*	p25	p50	p75	p90	Mean	Std. Dev.
Dalian	0	0	4	8	2.2	3.3
Shanghai	0	0	1	5	1.5	3.6
Wuhan	0	1	4	9	3.1	4.9
Shenzhen	0	1	4	8	2.7	4.2
Chongqing	0	0	3	8	2.4	4.4
Total	0	0	3	8	2.3	4.2

Health1, the Fan's index. From good health (small value) to bad health (high value)
Source: CASS Migrants' survey, 5 cities

Table 4: Healthcare Access and Insurance by city

City	Healthcare access					Having Health Insurance (%)
	(%)	Mean HCE	Std. dev. HCE	Insured (%)	Not insured (%)	
Dalian	***41.6***	***963.9***	4 116.2	32.8	44.5	80.0
Shanghai	63.0	563.6	1 114.8	64.7	57.9	28.2
Wuhan	60.9	470.5	846.0	63.4	50.8	27.2
Shenzhen	55.0	493.9	1 088.6	53.5	57.7	14.4
Chongqing	78.1	515.1	1 405.5	80.4	77.9	18.3
Total	61.0	560.5	1724.6	63.9	53.9	31.0

Source: CASS Migrants' survey, 5 cities, 2 398 observations.
HCE: Health care expenditure

The health indicator called *Health1* in the data is created according to Fan Ming's 2002 book. There are six questions which Fan Ming weights; the indicator is equal to the weighted sum of these variables.

The health indicator called *Health2* in the data is the unweighted sum of the answers to the health questions. See the Table below for more details;

Figure 2

Measuring Health Condition of Migrant Workers	Variable format	Weight (w)
Difficulty in raising hand and bending in recent 1 month	Yes/No	If yes, w=6; if No, w=0
Difficulty in walking 1 km in recent 1 month	Yes/No	If yes, w=6; if No, w=0
Difficulty in climbing stairs in the last month	Yes/No	If yes, w=6; if No, w=0
Feeling headache or swirling often in past three months	Yes/No	If yes, w=3; if No, w=0
Feeling extremely tired in recent 1 month	Yes/No	If yes, w=4; if No, w=0
Feeling stressed in recent 1 month	1^{st} to 6^{th} levels	w=0, …, w=5

Table 8: Descriptive Statistics for the Independent Variables

%			All sample	
			Mean	Std Dev.
Gender			52,0	0,50
Age (30-40)			30,0	0,46
Age over 40			12,6	0,33
Junior School			56,4	0,50
High School			29,2	0,45
College			3,3	0,18
Income			1 434€	910,80
Remittance			212€	263,53
Health Ins.			33,3	0,47
NCMS Ins.			21,2	0,41
Fixed-term contract			54,8	0,76
Firm size (from 1-small to 3-large)			2,28*	0,26
Sector	Construction		7,2	0,49
	Manufacturing		60,2	0,30
Ownership	State-owned		10,1	0,25
	Collective		6,9	0,43
	foreign or JV		25,3	0,50
Expenditure > Q25		Clothing	22,3	0,42
		Transportation	8,6	0,28
		Education	79,6	0,40
		House	37,3	0,48
More than 2 acquaintances			79,8	0,40
Feels socially integrated			55,9	0,50

*: in size of firm_ 1 is small, 2 is medium and 3 is large_.

Source: CASS Migrants' survey, 5 cities

Table 5: Healthcare Access

VARIABLES	(1)	(2)	(3)	(4)	(5)
Good/Fair Health	0.216**	0.214**	0.232**	0.234**	0.240**
	(0.0990)	(0.0992)	(0.0996)	(0.0998)	(0.105)
Bad health	0.577***	0.575***	0.596***	0.590***	0.706***
	(0.181)	(0.182)	(0.182)	(0.182)	(0.197)
Very bad health	0.632***	0.634***	0.677***	0.675***	0.615**
	(0.242)	(0.242)	(0.245)	(0.245)	(0.251)
Gender	0.200**	0.197**	0.279***	0.267***	0.250**
	(0.0942)	(0.0950)	(0.0971)	(0.0974)	(0.101)
Age (30-40)	0.419***	0.420***	0.371***	0.356***	0.345***
	(0.106)	(0.108)	(0.107)	(0.110)	(0.115)
Age over 40	0.463***	0.462***	0.504***	0.475***	0.452***
	(0.153)	(0.157)	(0.154)	(0.158)	(0.160)
Junior School		-0.119		-0.186	-0.174
		(0.161)		(0.163)	(0.165)
High School		-0.0627		-0.181	-0.149
		(0.175)		(0.179)	(0.183)
College		0.500		0.272	0.327
		(0.311)		(0.327)	(0.337)
Log(Income)			0.472***	0.458***	0.397***
			(0.129)	(0.133)	(0.140)
Log(Remittances)					0.0311**
					(0.0128)
Health Ins.	-0.113	-0.139	-0.175	-0.181	-0.238**
	(0.108)	(0.109)	(0.110)	(0.111)	(0.114)
Number of provinces	5	5	5	5	5

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 6: Healthcare Access for bad health conditions (*Model A*)

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Gender	0.229**	0.227**	0.241**	0.146	0.145	0.100
	(0.108)	(0.108)	(0.109)	(0.113)	(0.113)	(0.107)
Age (30-40)	0.233*	0.232*	0.210*	0.00881	0.00905	0.00515
	(0.124)	(0.124)	(0.125)	(0.137)	(0.137)	(0.131)
Age over 40	0.370**	0.370**	0.305*	0.228	0.233	0.327*
	(0.172)	(0.172)	(0.175)	(0.183)	(0.183)	(0.174)
Junior school	-0.350*	-0.351*	-0.355**	-0.481***	-0.482***	-0.456**
	(0.180)	(0.180)	(0.181)	(0.187)	(0.187)	(0.179)
High school	-0.344*	-0.345*	-0.337*	-0.461**	-0.459**	-0.474**
	(0.199)	(0.199)	(0.200)	(0.206)	(0.206)	(0.199)
College	0.133	0.132	0.103	0.0162	0.0160	0.0478
	(0.356)	(0.356)	(0.358)	(0.364)	(0.364)	(0.353)
Log(Income)	0.372**	0.371**	0.329**	0.121	0.118	0.103
	(0.150)	(0.150)	(0.154)	(0.164)	(0.164)	(0.158)
Log(Remittance)	0.0385***	0.0385***	0.0396***	0.0494***	0.0494***	0.0482***
	(0.0136)	(0.0136)	(0.0137)	(0.0141)	(0.0141)	(0.0133)
Health Ins.	-0.308**	-0.314**	-0.305**	-0.338***	-0.336***	0.133*†
	(0.120)	(0.126)	(0.125)	(0.130)	(0.130)	(0.076)
NCMS			0.0958	0.0596		0.00852
			(0.128)	(0.130)		(0.123)
Construction Ind.			0.472**	0.561**	0.566**	0.622***
			(0.218)	(0.223)	(0.223)	(0.220)
Manufacturing Ind.			0.171	0.161	0.166	0.210
			(0.151)	(0.154)	(0.154)	(0.146)
State-owned firm			0.0239	0.0135	0.0156	-0.0173
			(0.181)	(0.185)	(0.185)	(0.181)

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Model A continued

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Collective firm			0.192	0.119	0.118	0.115
			(0.218)	(0.222)	(0.222)	(0.210)
Foreign and JV firm			0.107	0.0903	0.0830	-0.102
			(0.182)	(0.186)	(0.185)	(0.188)
Fixed-term contract				-0.0655	-0.0668	-0.151
				(0.117)	(0.117)	(0.112)
Clothing expenditures				-0.191	-0.192	-0.214*
				(0.136)	(0.136)	(0.128)
Transport. expenditures				-0.503***	-0.506***	-0.460***
				(0.187)	(0.187)	(0.176)
Education expenditures				-0.461***	-0.458***	-0.417***
				(0.152)	(0.152)	(0.146)
House expenditures				-0.376***	-0.377***	-0.386***
				(0.119)	(0.119)	(0.114)
Acquaintances				0.380***	0.384***	0.372***
				(0.133)	(0.133)	(0.125)
Feeling socially integrated				0.0633	0.0614	0.0234
				(0.111)	(0.110)	(0.105)
Ins*Dalian		0.0654				
		(0.401)				
						IV Model
Number of province	5	5	5	5	5	5

Ref: migrants who are illiterate or with an elementary level of education, working in the Service Industry, in a large private Chinese firm.

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

†: Instrumented variable validated by a Hausman test

Controlling for within variation in health status using *Health2*

Table 7: Healthcare Access for Severe Health Conditions (*Model B*)

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Gender	0.543*	0.555*	0.705**	0.848**	0.852**	0.852**
	(0.318)	(0.321)	(0.334)	(0.352)	(0.352)	(0.339)
Age (30-40)	1.271***	1.292***	1.220***	0.905**	0.905**	1.008**
	(0.364)	(0.369)	(0.378)	(0.428)	(0.429)	(0.414)
Age over 40	0.950**	0.983**	0.722	0.874	0.877	1.021**
	(0.462)	(0.464)	(0.480)	(0.545)	(0.544)	(0.514)
Junior school	0.730*	0.805*	0.713	0.536	0.544	0.702
	(0.436)	(0.443)	(0.458)	(0.488)	(0.488)	(0.479)
High school	1.069**	1.032*	1.133**	0.903	0.922	0.939*
	(0.532)	(0.533)	(0.551)	(0.576)	(0.573)	(0.561)
College	1.648	1.324	1.888	1.678	1.671	1.714
	(1.254)	(1.224)	(1.271)	(1.272)	(1.273)	(1.277)
Log(Income)	0.771*	0.755*	0.906**	0.986**	0.996**	0.740
	(0.403)	(0.403)	(0.436)	(0.467)	(0.467)	(0.457)
Log(Remittance)	-0.0272	-0.0236	-0.0336	-0.0371	-0.0363	-0.0469
	(0.0394)	(0.0398)	(0.0406)	(0.0432)	(0.0432)	(0.0414)
Health Ins.	0.357	0.0620	0.851*	0.913*	0.892*	0.919*†
	(0.393)	(0.421)	(0.453)	(0.478)	(0.474)	(0.530)
NCMS			-0.124	-0.130		-0.0702
			(0.383)	(0.410)		(0.384)
Construction Ind.			0.471	0.546	0.550	0.380
			(0.695)	(0.719)	(0.720)	(0.687)
Manufacturing Ind.			-0.186	-0.224	-0.226	0.00424
			(0.449)	(0.479)	(0.479)	(0.446)
State-owned firm			1.311**	1.274**	1.257**	0.797
			(0.582)	(0.588)	(0.585)	(0.549)

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Model B continued

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Collective firm			0.267	0.292	0.287	0.294
			(0.599)	(0.618)	(0.618)	(0.573)
Foreign and JV firm			-0.622	-0.431	-0.434	-0.657
			(0.469)	(0.493)	(0.493)	(0.495)
Fixed-term contract				-0.200	-0.180	-0.315
				(0.344)	(0.338)	(0.352)
Clothing expenditures				0.545	0.551	0.607
				(0.405)	(0.404)	(0.390)
Transport expenditures				-1.628**	-1.619**	-1.464**
				(0.783)	(0.781)	(0.669)
Education expenditures				0.543	0.542	0.305
				(0.448)	(0.448)	(0.432)
House expenditures				0.227	0.224	0.0628
				(0.329)	(0.329)	(0.322)
Acquaintances				0.274	0.262	0.322*
				(0.410)	(0.409)	(0.166)
Feeling socially integrated				0.529*	0.531*	0.473*
				(0.319)	(0.318)	(0.256)
Ins*Dalian		2.071**				
		(1.041)				
						IV Model
Number of province	5	5	5	5	5	5

Ref: migrants who are illiterate or with an elementary level of education, working in the Service Industry, in a large private Chinese firm.

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Ref: Works in the Service Industry, in a large private Chinese firm

†: Instrumented variable validated by a Hausman test

Controlling for within variation in health status using *Health2*